Supporting Online Material for

Time Discounting Predicts Creditworthiness

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Contents

1 Set-Up and Table S1 (Summary Statistics)

The field study was conducted in 2006 and 2007 at two Volunteer Income Tax Assistance (VITA) sites in Boston, Massachusetts.[1] The field study concentrates on individuals *without* mortgages who have had enough credit information to have a FICO score. In the end, we have the following information for 437 individuals, which we match with their consent: a measure of people's time preferences, a person's FICO score, income data from tax returns and additional socio-demographics from a survey (if survey data was missing we set it to the majority value and control for it with a dummy. Excluding those observations doesn't change the results).

For the subsample in 2006 we also have FICO scores one year after we elicited time preferences. For 110 individuals we elicited TD measures in 2006 and they were scored by FICO one year later. As you need sufficient credit history to get scored only 98 of this sample actually were scored at the time of the TD choice experiment.

Table S1 shows summary statistics for our sample.

Table S1: Summary Statistics

Variable	Mean	s.d.
Panel A: Socio-Demographics characteristics		
Disposable Income	18872.51	13939.78
Race (Black=1)	0.75	0.44
Gender (Male=1)	0.29	0.45
Age	36.88	13.56
College Experience (=1)	0.50	0.50
# of Dependents	0.58	0.86
Panel B: Creditworthiness		
FICO score	610.52	84.03
Panel C: Time Preferences		
Time Discounting (TD)	0.87	0.14
Dummy if Multiple Switching Points	0.11	0.31

Based on 437 observations.

[1]There were 22 VITA sites at the time of the study in and around Boston, MA. Coordinated by a city-wide coalition of government and business leaders, VITA sites provide free tax preparation assistance to low-to-moderate income households. Taxes are prepared by volunteers throughout tax season, from late-January to mid-April each year.

2 Measuring Time Preferences

In our study, individuals were given three choice sets and asked to make various choices between a smaller, sooner reward ($\$X$) in period t (SS) and a larger, later reward ($\$Y > \$X$) in period $t+\tau > t$ (LL). In total, individuals were given 22 choices (19 in 2006) over three different time frames: in two time frames t is the present ($t = 0$) and τ is either one ($\tau = 1$) or six months ($\tau = 6$). In the third time frame, t is in six months ($t = 6$) and τ is one month ($\tau = 1$). In 2006, $\$Y = \$80$ and $\$X$ was varied from \$75 to \$30 (see the instructions in Section 4). In 2007, $\$Y = \$50$ and $\$X$ was varied from \$49 to \$14.

The choice experiments enable us to measure the degree of an individuals time discounting (TD). We calculate an individual discount factor (IDF) using the point, X^*, at which individuals switch from opting for the smaller, sooner (SS) payment to the larger, later (LL) payment in a given choice set. Individual discount factors are calculated as:

$$IDF = (\tfrac{X^*}{Y})^{1/\tau}$$

Making these calculations yields three discount measures, $IDF_{t,\tau}$: $IDF_{0,1}$, $IDF_{0,6}$, $IDF_{6,1}$. We use the average of the calculated monthly discount factor (TD). Panel C in Table S1 shows that TD is 0.87. To construct Figure 1 in the main text, we divide people into quartiles according to their TD.

We take the first switching point in the list of choices as the indicator of a person's degree of time discounting. There are, however, a number of individuals that have multiple switching points in one choice sets. About 11 percent of our participants exhibit multiple switching points. To check whether our results are robust to excluding participants with multiple switching points we run the analysis by also excluding multiple switchers. By doing so we focus on subjects with a single switching point. The correlation between TD and FICO hold (Spearman's $\rho = .1376, N = 390, p < .007$).

To measure the importance of immediacy, we use a β-δ model (e.g. Laibson, 1997). Comparing the choices in "TD 0-1 month" (choices between today (t) and 1 month (T=1 month)) with "TD 6-7 months" (choices between 6 ($t + 6$) and 7 months (T=1 months)) allows to calculate β and δ: As in "TD 6-7 months" the present is not involved it will give us the δ and "TD 0-1 month" divided by "TD 6-7 months" gives β (Figner et al., 2010; Meier and Sprenger, 2010).

In order to make experimental responses incentive compatible, 10 percent of individuals were randomly paid one of their choices. Individuals were informed that winning money orders would be sent by mail to the winner's home address on the same day as the experiment (if $t = 0$), or in one, six, or seven months, depending on the winner's previous experimental choice. Money orders were sent by mail to equate transaction costs for SS and LL payments.

3 Table S2: Full Regression TD and FICO Score

	(1)	(2)
Time Discounting Factor (TD)	77.622***	
	(26.915)	
β		13.547
		(16.942)
δ		61.368***
		(21.180)
Disposable Income	0.001***	0.001***
	(0.000)	(0.000)
# of Dependents	–4.675	–4.594
	(4.904)	(4.911)
College Experience (=1)	13.759	13.235
	(9.066)	(9.081)
Age	0.660	0.800
	(1.682)	(1.691)
Age Squared	0.006	0.004
	(0.020)	(0.020)
Gender (Male=1)	–13.228	–13.381
	(9.225)	(9.253)
Race (Black=1)	8.642	8.363
	(9.580)	(9.599)
Total Borrowing	0.000*	0.000*
	(0.000)	(0.000)
Constant	478.875***	477.939***
	(40.486)	(43.627)
R^2	0.136	0.136
N	437	437

Note: Coefficients of OLS regressions. Dependent variable: Individual's credit score (FICO). Standard errors are presented in parentheses. Dummy variables for whether College Experience, Gender or Race are imputed are included in the regression but omitted from the table.
Level of significance: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

4 Experimental Instructions

4.1 Instructions in 2006

Please indicate for each of the following 19 decisions, whether you would prefer the smaller payment in the near future or the bigger payment later. The number of your raffle ticket (none or 1 to 19), will indicate which decision you will be paid, if at all.

[Block 1; $t = 0$, $\tau = 1$]: Option A (**TODAY**) or Option B (**IN A MONTH**)
Decision (1): $ 75 guaranteed **today** - $ 80 guaranteed **in a month**
Decision (2): $ 70 guaranteed **today** - $ 80 guaranteed **in a month**
Decision (3): $ 65 guaranteed **today** - $ 80 guaranteed **in a month**
Decision (4): $ 60 guaranteed **today** - $ 80 guaranteed **in a month**
Decision (5): $ 50 guaranteed **today** - $ 80 guaranteed **in a month**
Decision (6): $ 40 guaranteed **today** - $ 80 guaranteed **in a month**

[Block 2; $t = 0$, $\tau = 6$]: Option A (**TODAY**) or Option B (**IN 6 MONTHS**)
Decision (7): $ 75 guaranteed **today** - $ 80 guaranteed **in 6 months**
Decision (8): $ 70 guaranteed **today** - $ 80 guaranteed **in 6 months**
Decision (9): $ 65 guaranteed **today** - $ 80 guaranteed **in 6 months**
Decision (10): $ 60 guaranteed **today** - $ 80 guaranteed **in 6 months**
Decision (11): $ 50 guaranteed **today** - $ 80 guaranteed **in 6 months**
Decision (12): $ 40 guaranteed **today** - $ 80 guaranteed **in 6 months**
Decision (13): $ 30 guaranteed **today** - $ 80 guaranteed **in 6 months**

[Block 3; $t = 6$, $\tau = 1$]: Option A (**IN 6 MONTHS**) or Option B (**IN 7 MONTHS**)
Decision (14): $ 75 guaranteed **in 6 months** - $ 80 guaranteed **in 7 months**
Decision (15): $ 70 guaranteed **in 6 months** - $ 80 guaranteed **in 7 months**
Decision (16): $ 65 guaranteed **in 6 months** - $ 80 guaranteed **in 7 months**
Decision (17): $ 60 guaranteed **in 6 months** - $ 80 guaranteed **in 7 months**
Decision (18): $ 50 guaranteed **in 6 months** - $ 80 guaranteed **in 7 months**
Decision (19): $ 40 guaranteed **in 6 months** - $ 80 guaranteed **in 7 months**

4.1.1 Instructions in 2007

As a tax filer at this Volunteer Income Tax Assistance site you are automatically entered in a raffle in which you could win up to $50. Just follow the directions below:

How It Works: In the boxes below you are asked to choose between smaller payments closer to today and larger payments further in the future. For each row, choose one payment: either the smaller, sooner payment or the later, larger payment. When you return this completed form, you will receive a raffle ticket. If you are a winner, the raffle ticket will have a number on it from 1 to 22. These numbers correspond to the numbered choices below. You will be paid your chosen payment. The choices you make could mean a difference in payment of more than $35, so CHOOSE CAREFULLY!!!
RED BLOCK (Numbers 1 through 7): Decide between payment **today** and payment in **one month**
BLACK BLOCK (Numbers 8 through 15): Decide between payment **today** and payment in **six months**
BLUE BLOCK (Numbers 16 through 22): Decide between payment in **six months** and payment in **seven months**

Rules and Eligibility: For each possible number below, state whether you would like the earlier, smaller payment or the later, larger payment. Only completed raffle forms are eligible for the raffle. All prizes will be sent to you by normal mail and will be paid by money order. One out of ten raffle tickets will be a winner. You can obtain your raffle ticket as soon as your tax filing is complete. You may not participate in the raffle if you are associated with the EITC campaign (volunteer, business associate, etc.) or an employee (or relative of an employee) of the Federal Reserve Bank of Boston or the Federal Reserve System.

[Red Block; $t = 0$, $\tau = 1$]
TODAY VS. ONE MONTH FROM TODAY WHAT WILL YOU DO IF YOU GET A NUMBER BETWEEN 1 AND 7? Decide for **each** possible number if you would like the smaller payment for sure **today** or the larger payment for sure in **one month**? Please answer for each possible number (1) through (7) by filling in one box for each possible number.
Example: If you prefer $49 today in Question 1 mark as follows: ✓ $49 today or $50 in one month
If you prefer $50 in one month in Question 1, mark as follows: $49 today or ✓ $50 in one month
If you get number (1): Would you like to receive $49 **today** or $50 in **one month**
If you get number (2): Would you like to receive $47 **today** or $50 in **one month**
If you get number (3): Would you like to receive $44 **today** or $50 in **one month**
If you get number (4): Would you like to receive $40 **today** or $50 in **one month**
If you get number (5): Would you like to receive $35 **today** or $50 in **one month**
If you get number (6): Would you like to receive $29 **today** or $50 in **one month**
If you get number (7): Would you like to receive $22 **today** or $50 in **one month**

[Black Block; $t = 0$, $\tau = 6$]
TODAY VS. SIX MONTHS FROM TODAY WHAT WILL YOU DO IF YOU GET A NUMBER BETWEEN 8 AND 15? Now, decide for **each** possible number if you would like the smaller payment for sure **today** or the larger payment for sure in **six months**? Please answer each possible number (8) through (15) by filling in one box for each possible number.
If you get number (8): Would you like to receive $49 **today** or $50 in **six months**
If you get number (9): Would you like to receive $47 **today** or $50 in **six months**
If you get number (10): Would you like to receive $44 **today** or $50 in **six months**
If you get number (11): Would you like to receive $40 **today** or $50 in **six months**
If you get number (12): Would you like to receive $35 **today** or $50 in **six months**
If you get number (13): Would you like to receive $29 **today** or $50 in **six months**
If you get number (14): Would you like to receive $22 **today** or $50 in **six months**
If you get number (15): Would you like to receive $14 **today** or $50 in **six months**

[Blue Block; $t = 6$, $\tau = 1$]
SIX MONTHS FROM TODAY VS. SEVEN MONTHS FROM TODAY WHAT WILL YOU DO IF YOU GET A NUMBER BETWEEN 16 AND 22? Decide for **each** possible number if you would like the smaller payment for sure in **six months** or the larger payment for sure in **seven months**? Please answer for each possible number (16) through (22) by filling in one box for each possible number.
If you get number (16): Would you like to receive $49 in **six months** or $50 in **seven months**
If you get number (17): Would you like to receive $47 in **six months** or $50 in **seven months**
If you get number (18): Would you like to receive $44 in **six months** or $50 in **seven months**
If you get number (19): Would you like to receive $40 in **six months** or $50 in **seven months**
If you get number (20): Would you like to receive $35 in **six months** or $50 in **seven months**
If you get number (21): Would you like to receive $29 in **six months** or $50 in **seven months**
If you get number (22): Would you like to receive $22 in **six months** or $50 in **seven months**

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